

# The Determinants of Developing Countries' Access to the International Capital Market

ROBERT LENSINK and PETER A.G. VAN BERGEIJK

*The traditional analysis of Western credit relations with Developing Countries mainly focuses on the possibilities of debtor countries' meeting their debt obligations and tries to find factors behind possible default. The present study explicitly considers flows of funds between creditors and debtors and investigates the determinants of developing countries' access to the international capital market. A combination of GDP per capita, net-debt-to-GDP and the investment share predicts access to the 1985-87 capital market correctly in 75 per cent of the cases.*

## I. INTRODUCTION

The traditional analysis of the debt crisis focuses on the possibilities of debtor countries' meeting their debt obligations to western creditors, the conditions under which debtor countries repudiate their debts and policy adjustments which improve on the debtor countries' creditworthiness or reduce their debt burdens. Most empirical studies try to find determinants which explain a country's reliability as a borrower, that is, factors behind a possible default. Saini and Bates [1984] survey a number of empirical default studies. The (binary) dependent variable, 'default', is generally approximated by the occurrence of multilateral rescheduling. Significant indicators that have been found are: the debt/GDP ratio, the debt/export ratio, inflation, investments, income per capita, the imports/reserves ratio and debt-service requirements.

The studies which take restructuring as the dependent variable, however, according to Eaton, Gersovitz and Stiglitz [1986: 507], do

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Robert Lensink and Peter A.G. van Bergeijk are respectively at the University of Groningen and Foundation for International Development Economics, and Ministry of Economic Affairs, DG-BEB, The Hague. This article does not necessarily reflect the opinion of the government of The Netherlands. A preliminary version of this article was presented at the Fifth Annual Congress of the European Economic Association (Lisboa, 31 August 1990) and appeared in Dutch as Van Bergeijk and Lensink [1989b]. Comments by Kees Eitjes, Henk Jager, Henk de Haan, Catrinus Jepma, Ger Lanjouw, the members of the research project Exchange Rate Policy and Monetary Policy in International Dependence and an anonymous referee were very useful. Jouke van Dijk helped solve some statistical questions.

not answer the most important question of international lending: 'When will a country with certain characteristics, owing a certain amount of debt under certain contractual arrangements, pay or receive funds from creditors with certain characteristics?' In their opinion one should focus on flows of funds between creditors and debtors.

This study tries to answer one part of this question by investigating the factors which give a debtor country the opportunity to receive private funds (for example, bank lending). Our aim is to inquire into the debtor country's characteristics that determine its access to the international capital market. In the practice of international lending it appears that the international capital market is closed for many developing countries. Since several projections suggest that the financing needs of developing countries exceed the available official funds substantially [e.g. *Lensink and van Bergeijk, 1991*] the future possibility of raising funds on the international capital market is highly important. Unlike most other empirical studies the dependent variable in our investigation is therefore not multilateral rescheduling but the observation whether a country has access to the international capital market or not.<sup>1</sup>

Section II surveys literature on international bank lending. Credit rationing is the central issue. Section III explains our method. Logit analysis has been used to test several theoretically conceivable variables on their empirical significance for predicting access to the 1985, 1986 and 1987 international capital market. Section IV describes the explanatory variables. Section V presents the empirical results. It turns out that a combination of GDP per capita, net-debt-to-GDP and the investment share predicts developing countries' access to the 1985-87 capital market correctly in 75 per cent of all cases. Section VI summarises and discusses some policy relevant implications.

## II. CREDIT RATIONING

The traditional theory of international borrowing and lending assumes that domestic and world loan markets are fully integrated and that every country can borrow and lend freely at the world interest rate.<sup>2</sup> Interest rate flexibility provides the mechanism to ensure an equilibrium between demand and supply so that suppliers of credit and credit applicants are always satisfied. An excess demand or an excess supply leads to an immediate interest rate adjustment which equilibrates the credit market. In this model the realised (ex post) amount of credit is subject only to the borrowing country's intertemporal budget constraint. This requires that the country is able to repay its debt in the long run. Hence the net debt must equal the discounted value of future trade surpluses. Thus,

traditional theory assumes that each country may borrow or lend at a given interest rate, subject only to the constraint that the borrower is able to repay its debt in the long run by using its resources. In the practice of international lending, however, the solvency issue does not seem to play an important role since 'the debt of a country in almost all instances is less than the value of the assets owned by nationals and the government of the country' [Eaton, Gersovitz and Stiglitz, 1986: 484]. Capital markets appear to be imperfect so that the debtor countries are often substantially rationed in borrowing [e.g. Sachs, 1984: 1; Sachs and Cohen, 1985: 211].

Recent literature explicitly considers the possibilities of credit rationing. Following Jaffee and Russell [1976], Stiglitz and Weiss [1981; 1988] develop a model which explains credit rationing. Credit rationing in their model characterises the market equilibrium. The interest rate is not a conventional price determining the number of units of one good that is given up for one unit of another good. The contractual interest obligation is an *agreement* for future payments. This agreement is sometimes not adhered to and the probability that the agreement will be violated increases the higher is the interest rate demanded. A higher interest rate may, moreover, lead to a less favourable composition of the group of loan applicants (adverse-selection-effect). First, borrowers prepared to pay higher interest rates are usually risk lovers. These individuals or countries undertake projects that are characterised by higher profits, if they succeed, combined with a higher probability of failure. Second, the willingness to pay higher interest rates may be an indication of too optimistic a view about the probability that the project succeeds. Finally, some loan applicants are just not ready to repay the loan, independently of the level of the interest rate. Obviously, the interest rate is never prohibitive for this group.<sup>3</sup> Moreover, higher interest rates stimulate *individual* borrowers to follow strategies with a higher risk (adverse-incentive-effect). Higher costs of capital usually imply that higher yields are required to obtain equal profits. Hence projects with higher risks are undertaken. Both the adverse-selection-effect and the adverse-incentive-effect of a higher interest rate lead to a decline in the lender's expected yield if the interest rate rises above some critical threshold. Therefore private banks are not prepared to raise the interest rate above this threshold despite the excess demand for credit.

Eaton and Gersovitz [1981a], Sachs and Cohen [1985] and Cohen and Sachs [1986] emphasize that debtors may benefit from defaults. Since in international lending it is very difficult to ensure that the borrower repays loans, because of limited enforceability of loan contract obligations, the incentive of debtors to default leads lenders to ration credit. Eaton and Gersovitz [1981a and 1981b] introduced default risk,

modelling international lending as a game between the debtor and the creditor. If debtors default, creditors exclude the debtors from future borrowing. Sachs and Cohen [1985] extend the Eaton–Gersovitz model by considering a decline in a country's possibility to trade as an additional cost of default and by providing the debtors with the possibility of improving their creditworthiness by allocating a larger part of their loans to investment.

Another strand of literature questions the validity of the general assumption that debtor countries default as soon as the amount saved by repudiation of interest and/or debt exceeds the present discounted value of future net supply of foreign capital. Hojman [1987] and Kaletsky [1985] argue that the default rule which recommends repudiation if new loans are lower than payments on old ones is misleading. Indeed, as Van Bergeijk [1988] formally shows, a co-operative equilibrium between creditor banks and debtor countries may exist even though no additional foreign capital flows towards the debtor countries. Long-term international credit relations appear to require some volume of gross lending, but positive net capital flows do not seem to be a necessary condition.

Eaton and Gersovitz [1980; 1981b] estimate debt supply and debt demand equations. They conclude that in the early seventies the realized amount of credit is supply-determined in 80 per cent of the investigated cases. Morgan [1987] re-estimated the Eaton–Gersovitz model with more recent data. He concludes that LDCs were less credit constrained in the late 1970s than in the early 1970s. Studies for the 1980s are not available. The studies mentioned are therefore not directly suitable for analyses of the actual state of affairs on the credit market. Private banks' behaviour after the debt crises, however, suggests that it is reasonable to assume that the share of cases in which the amount of credit is supply-determined has increased after 1982 [e.g., Bird, 1986: 1–2].

Some empirical studies emphasise the use of the spread above the London Inter Bank Offered Rate as an instrument.<sup>4</sup> These studies assume that banks raise the spread if loans become more risky. Banks, however, usually react not only by adjusting the spread because of higher risks, but also and mainly by restricting their supply of credit. Inoue and Nukaga [1985: 237], e.g., conclude that, in contrast to common sense, both the spread and the volume of credit decreased simultaneously in 1983 and 1984.

Finally, institutional factors often force banks to ration the volume of credit rather than to raise interest rates. Generally, banks are obliged to establish loan-loss reserves for each risky project. It is unlikely that at

present the interest proceeds of additional credit to problem countries compensate for the required increase in loan-loss reserves, given the substantial discounts on the secondary debt market.

### III. ON THE METHOD

The present article explicitly considers flows of funds between creditors and debtors, as Eaton, Gersovitz and Stiglitz [1986: 507] suggest. Our aim is to investigate those factors that determine a country's access to the international capital market. Starting from the assumption that the countries in our data set<sup>5</sup> are *grosso modo* credit constrained, the creditor determines a country's access to the international capital market.

As an indicator for access we use the observation whether a country, according to OECD capital market statistics, raised funds on the international capital market in 1985, 1986, and 1987. If a country raises funds we conclude that this country has access to the international capital market and can borrow from abroad. On the other hand, we assume that the international capital market is closed for countries that do not raise funds and hence these countries do not have the opportunity to borrow from abroad. We corrected the explanatory variable for those countries that restructured their debts in the relevant year, because lending to restructuring countries consists in general of forced loans. Since we are interested in spontaneous lending to developing countries, excluding forced lending seems to be the obvious thing to do here. The correction pertained to ten cases: among others for Argentina (1986), Mexico (1985), Venezuela (1987) and Yugoslavia (1985 and 1987). Moreover, we treat countries classified by Nunnenkamp [1990] and Nunnenkamp and Schweikert [1989] as non-rationed debtors (Algeria, Indonesia, Malaysia, South-Korea, Thailand, Turkey and Tunisia) as countries which do have access to the international capital market irrespective of whether they raise funds.<sup>6</sup> The latter correction, anyhow, pertained to two cases only: Indonesia (1985) and South-Korea (1987). Note, however, that these corrections sometimes are quite arbitrary [e.g., Nunnenkamp, 1990: 556–8]. Hence the empirical results should be interpreted with caution.

The dependent variable  $y$  is a binary dummy variable that assumes the value 1 if a country had access to the international capital market:

$$y = 1, \text{ if the country raised funds on the international capital market} \\ y = 0, \text{ if not.}$$

One might want to question the use of gross instead of net credit flows as well as the transformation of the observed gross flows into a crude binary

dummy measure.

Focusing on net flows is obviously a very policy relevant approach for the debtor countries. In this article, however, we study gross private flows because banks decide on disbursements and not on the other components of net capital flows, such as the amount of repayment, capital flight, etc. A second reason is that it is gross lending and not net lending which is the necessary condition for continuation of long-term credit relationships. Thirdly, data on net private capital flows are not available for all countries studied in this article.<sup>7</sup>

The binary transformation of positive gross flows into 1 and of non-flows into 0 bypasses the problem of the arbitrariness in the way the amount of lending should be scaled if actual observations were to be used. Scaling obviously would be necessary in order to account for the different size of the sampled economies. However, it is not *a priori* clear what is the appropriate scaling variable. GDP, exports, the balance on current account, the external debt (both gross and net) and even the population are possible candidates. Hence the choice of the scaling variable would introduce additional arbitrariness into the estimations. Moreover, the actual amount of lending is not really of concern as, in line with the literature reviewed, we want to distinguish between two regimes 'access' and 'no access'.

The equations are estimated using logit analysis on pooled data. Logit analysis enables one to calculate the probability that a country has access to the international capital market. Let  $P_i$  be the probability that, given knowledge of the vector of explanatory variables  $x$ , a country has access to the international capital market, and  $\alpha$  and  $\beta$  be the estimated parameters, so that the Logit model becomes:

$$P_i = F(\theta) = F(\alpha + \beta x_i) = 1 / (1 + e^{-\theta})$$

A pooled data set, for three years, of a cross section of approximately 95 countries of which 30 per cent actually had access to the capital market has been used to estimate the parameters of the Logit model. The data set only comprises developing countries. The explanatory variables are one period lagged since decisions about bank lending in general will be based on the analysis of historical data.<sup>8</sup> Moreover, investigating the *lagged* influence on the dependent variable reduces the problems of simultaneity to some extent. The dependent variable pertains to 1985, 1986 and 1987.

To take account of the heterogeneity of the country sample we distinguished four country regions: Asia, the Heavily Indebted Countries (HICs), Sub-Saharan Africa and a Rest group. In all Equations intercept dummies for countries belonging to a certain region are taken into account.

## IV. THE EXPLANATORY VARIABLES

Several economic performance variables and traditional creditworthiness indicators are tested on their empirical significance for predicting access to the 1985, 1986 and 1987 international capital market.

*Economic Performance Variables:*

$Y/P$  = GDP per capita

$Y^*$  = the real rate of GDP growth

$INF$  = the inflation rate

$I/Y$  = gross domestic investments as a percentage of GDP

$UFC$  = use of IMF credit as a percentage of the country's Fund quota

We expect a positive sign for  $Y/P$ ,  $Y^*$  and  $I/Y$  and a negative sign for  $INF$ , under the assumption that better economic performance increases a country's chance to have access to the international capital market. The sign of  $UFC$  is not clear beforehand. A high value of  $UFC$  suggests that the country is a problem debtor to which lenders are not willing to lend. An increase in  $UFC$ , however, also shows that a country is willing to follow an IMF adjustment programme, which may stimulate private lending.

*Creditworthiness Indicators:*

$ND/Y$  = ratio of net external debt to GDP

$GD/Y$  = ratio of gross external debt to GDP

$GD/E$  = ratio of gross external debt to exports of goods and services

$R/M$  = ratio of international reserves to imports

$R/GD$  = ratio of international reserves to gross external debt

$SD/E$  = ratio of short-term debt to exports

$DBS/E$  = the debt-service ratio (debt service as percentage of exports of goods and services)

$DBS/GNP$  = debt service relative to gross national product

We expect positive signs for  $R/M$  and  $R/GD$  and negative signs for the other ratios.

To avoid multicollinearity we do not use  $ND/Y$ ,  $GD/Y$  and  $DBS/GNP$  simultaneously. We, therefore, start making logit Equations with a basic model that has  $Y/P$  and one of the three above-mentioned creditworthiness indicators as possible determinants. Table 1 presents the results of these first regressions. Concerning the intercept dummies, only significant coefficients are presented. The other variables are added one by one in subsequent equations (Table 2). Significant determinants

are added to the basic model. In this way we can see whether the results are robust in the sense that the coefficient estimates do not dramatically change over different specifications.

## V. EMPIRICAL RESULTS

A positive coefficient indicates that an increase of the concerned variable leads to an increase of the probability of access to the international capital market. The errors-of-prediction refer to 'within' sample forecast errors, that is, prediction errors with respect to actual access to the international capital market in 1985, 1986 and 1987 for the countries in the sample.<sup>9</sup> The loglikelihood serves as a measure of the overall goodness-of-fit.<sup>10</sup> The model with the lowest loglikelihood has the best fit. Finally, the errors-of-prediction also serve as a criterion. It is assumed that smaller errors imply a better model.

TABLE 1  
RESULTS OF THE LOGIT ESTIMATION OF DETERMINANTS OF ACCESS TO THE  
INTERNATIONAL CAPITAL MARKET IN 1985, 1986 AND 1987

	Equation (1)	Equation (2)	Equation (3)
Number of observations	285	285	279
Countries that have access	87	87	85
GDP per capita	0.50 (4.38)	0.52 (4.44)	0.64 (4.31)
Net debt to GDP ratio	-1.29 (-4.50)		
Gross debt to GDP ratio		-1.05 (-4.24)	
Debt service to GNP ratio			0.07 (2.29)
INTERCEPT DUMMIES			
Sub-Saharan Africa	-1.44 (-4.25)	-1.47 (-4.33)	-2.73 (-7.60)
Heavily Indebted Countries			-2.03 (-4.53)
REST group of countries	-0.75 (-2.30)	-0.70 (-2.15)	-2.06 (-5.23)
Loglikelihood	-139.74	-141.34	-135.62
Errors of prediction:			
Type 1 $P_i > 0.5 \wedge y_i = 0$	28%	37%	32%
Type 2 $P_i < 0.5 \wedge y_i = 1$	21%	24%	24%

Note: (t-values in brackets)

The Equations (1), (2) and (3) in Table 1 show that a combination of



the net-debt-to-GDP ratio and the GDP per capita, a combination of the gross-debt-to-GDP ratio and the GDP per capita, or a combination of the debt-service over GNP ratio and the GDP per capita provide satisfactory explanations of access to the international capital market. Our basic determinants  $Y/P$ ,  $ND/Y$ ,  $GD/Y$  and  $DBS/GNP$  are all highly significant.

A choice between  $ND/Y$ ,  $GD/Y$  or  $DBS/GNP$  is not clearly guided by theoretical considerations. Gross debt is the total of foreign claims on the loan applicant, that is, a country. Net debt is defined as the gross debt minus the loan applicant's claims on other countries. The gross debt concept is relevant if one takes the juridically correct point of view that claims on a country do not constitute a basis for debiting if debt obligations are not fully met by some *residents* of this country. The net debt is relevant from the macroeconomic point of view since this variable represents the debt burden (the net interest obligation) more correctly. Concerning the choice between net debt or gross debt we prefer Equation (1), which uses net debt, since this equation statistically performs somewhat better than Equation (2). The  $t$ -value of the net-debt-to-GDP ratio is a little higher than the  $t$ -value of the gross-debt-to-GDP ratio, moreover the value of the loglikelihood is lower in Equation (1), suggesting a better overall goodness-of-fit. Finally the prediction errors of type 1 are significantly lower for Equation (1), while the prediction errors of type 2 are almost the same. We prefer Equation (1) also over Equation (3) since the  $t$ -value of the net-debt-to-GDP ratio is much higher than the  $t$ -value of the debt-service over GNP ratio and the errors of prediction are lower.

The intercept dummies of the first Equations show that the probability of having access to the international capital market for countries belonging to Sub-Saharan Africa is much lower than the probability of access for countries in the other regions.

GDP per capita ( $Y/P$ ) is significant at the 99 per cent confidence level in all Equations, implying that economic development is an important determinant of access to the international capital market. It is noteworthy that re-estimation of Equation (1) with restructuring as the dependent variable (which is the common procedure in traditional default analysis) shows a completely insignificant coefficient for  $Y/P$ :

$$\theta = \begin{array}{llll} 3.82 & ND/Y & -0.015 & Y/P & -2.40 & \text{Loglikelihood} & (1') \\ (3.37) & & (-1.10) & & (-7.79) & 109.3 & \end{array}$$

(See the specification of the logit model for an explanation.  $t$ -values are given in parenthesis.)

TABLE 2  
EXTENSIONS OF MODEL 2 WITH SOME ADDITIONAL VARIABLES

	GDP per Capita	Net debt to GDP	Investment share	Added Variable	INTERCEPT DUMMIES		Loglike-lyhood	Errors Type 1	Errors Type 2	Number of Observations
					SubSahara	Rest				
(4)	0.55 (3.63)	-1.00 (-2.37)	0.03 (2.16)		-2.43 (-5.33)	-1.52 (-3.48)	-126.13	29%	18%	269
(5)	0.52 (3.43)	-0.93 (-2.16)	.03 (2.29)	INFLATION -0.04 (-0.28)	-2.38 (-5.22)	-1.54 (-3.49)	-123.46	29%	19%	253
(6)	0.52 (3.51)	-0.93 (-2.18)	0.03 (1.95)	GDP-GROWTH 4.46 (1.27)	-2.62 (-5.56)	-1.63 (-3.62)	-120.84	26%	18%	260
(7)	0.54 (3.63)	-0.98 (-2.28)	0.03 (2.24)	GDP/EXPORT -0.01 (-1.10)	-2.37 (-5.24)	-1.48 (-3.39)	-125.07	26%	17%	265
(8)	0.57 (3.70)	-1.00 (-2.31)	0.03 (2.35)	RESERVES/ IMPORT -0.54 (-0.93)	-2.38 (-5.19)	-1.52 (-3.49)	-125.07	28%	18%	263
(9)	0.58 (3.72)	-0.98 (-2.24)	0.03 (2.29)	RESERVES/GDP -0.24 (-1.27)	-2.45 (-5.36)	-1.59 (-3.61)	-125.07	28%	18%	264
(10)	0.51 (3.25)	-1.03 (-2.38)	0.03 (2.31)	SHORT-TERM DEBT/EXPORT -0.07 (-0.86)	-2.34 (-5.18)	-1.45 (-3.34)	-124.82	30%	18%	263
(11)	0.55 (3.67)	-1.16 (-2.47)	0.03 (2.02)	USE OF FUND 0.001 (0.93)	-2.45 (-5.37)	-1.53 (-3.49)	-125.84	29%	18%	268
(12)	0.49 (3.12)	-1.05 (-2.43)	0.03 (2.35)	DEBT-SERVICE RATIO -0.001 (-0.74)	-2.35 (-5.18)	-1.41 (-3.16)	-123.85	29%	18%	261

Notes: (t-values between brackets)

Table 2 shows that an extension of our preferred basic model (Equation 1) with other creditworthiness indicators or economic performance variables does not change significantly the coefficients of our basic model (Equation 1), implying that the results are robust over different specifications. Moreover, the economic performance variable  $I/Y$  appears to be significant in all equations.<sup>11</sup> The coefficients of the other economic performance variables  $INF$ ,  $Y^*$  and  $UFC$  are insignificant at the usual levels (see Equations 5, 6, and 11, respectively). A significant coefficient for  $Y/P$  and an insignificant coefficient for  $Y^*$  implies that some countries are in the low-income trap and do not have access to the international capital market, despite good economic performance.

The signs of the coefficients of  $Y^*$ ,  $I/Y$ ,  $INF$  and  $UFC$  (the latter can be seen as an indicator for a country's willingness to follow an IMF adjustment programme), however, do not validate Krugman's statement that *if anything*, there is a perverse relation between good economic policies and supply of new money [Krugman, 1989: 312–13]. According to Krugman, the incentives for banks to supply new credit, in order to defend the value of the loans already made (defensive lending), may decline if debtors follow a sound economic policy, since defensive lending becomes unnecessary. Our study, however, suggests that better economic performance stimulates new lending, all the more since the coefficient of  $I/Y$  is significant at the usual confidence level. Nunnenkamp and Schweickert [1989], in their recent study concerning determinants of bank lending to *LDCs* arrive at the same conclusion.

Table 2 shows that countries of Sub-Saharan Africa, the HICs, and the Rest group of countries all have a negative intercept dummy, implying a lower probability of access to the international capital market given  $Y/P$  and  $ND/Y$ . Countries of Sub-Saharan Africa have by far the lowest probability of access. For the Asian countries the intercept dummy was not significant, implying that these countries have the highest probability of access to the international capital market.

The traditional indicators of creditworthiness, which are merely based on liquidity factors, perform badly. The coefficients of  $DBS/E$ ,  $GD/E$ ,  $R/M$ ,  $R/GD$  and  $SD/E$  are all insignificant. Some of them even have a wrong sign.

Our preferred model (Equation 1) makes large 'within sample' errors-of-predictions concerning Kenya and Liberia. These countries raised funds on the international capital market in 1986 and 1985 while the model predicted a probability of access of less than 20 per cent for these years. In 1985, 1987 and 1988, however, Kenya appeared to have no access to the international capital market so that, in general, our model predicts Kenya's access rightly. The same applies for Liberia

which did not raise funds in 1986, 1987 and 1988. For the Bahamas the model predicts a 70 per cent probability of access while the country did not raise funds.

It appears that our basic model (Equation 1) makes large errors of prediction for the same countries as Equation 4. Moreover, both Equations predict access to the 1985, 1986 and 1987 international capital market correctly in 75 per cent of all cases.

## VI. CONCLUSIONS

The investigation produces an equation which satisfactorily explains access to the international capital market in 1985, 1986, and 1987. The combination of GDP per capita, the net-debt-to-GDP ratio and the investment share predicts in 75 per cent of the cases correctly whether a country will have access to the international capital market. Several traditional creditworthiness indicators, however, prove to be insignificant determinants. Supply of foreign private lending and long-term credit relationships appear to be based on solvency factors rather than on liquidity factors. Countries of Sub-Saharan Africa have lower opportunities to borrow on the international capital market than countries of other regions. The Asian countries have the highest probability of access to the international capital market.

This investigation does not validate Krugman's [1989] statement that a negative relation exists between lending and economic performance. If anything, our study suggests that there is a positive relation between good economic policies and supply of new money. This study shows, however, the possibility of the existence of a low income trap in international lending, in which no relationship exists between good policy and lending. Improvements on economic policy in this regime do not increase a country's access to the international capital market. Hence in dealing with these countries debt forgiveness may be the only viable strategy.

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## NOTES

1. The present investigation is inspired by our efforts to endogenize private capital flows in the SARU world model (see Van Bergeijk and Lensink [1989a]).
2. For examples of the basic model of international borrowing, see Bardhan [1967], Sachs [1981] and Sachs [1984].
3. Note that this 'adverse selection' effect mainly appears if the lender is not as completely informed on the project as the borrower. Guesnery [1986] and Eaton, Gersovitz and Stiglitz [1986] show that this asymmetry of information is more

- important in domestic lending than in international lending. In many instances international bankers have the same amount of information on the returns of a project as domestic politicians.
4. McDonald [1982] surveys studies on this subject.
  5. See Appendix 1 for a list of countries.
  6. The problem of *other* non-borrowing countries that could have had access does seem less relevant since many studies suggest that the foreign capital requirements exceed the available foreign funds substantially for most developing countries [Fishlow, 1987, Lensink and van Bergeijk, 1991] so that these countries are rationed in borrowing and therefore the creditor determines a country's access to the international capital market.
  7. The World Bank supplies data on aggregated net capital flows for some countries, but these reflect also long-term public and publicly guaranteed credits.
  8. See Appendix 2 for the data sources.
  9. The errors of prediction are calculated by comparing the model's forecast, concerning access to the international capital market for each country, with the actual observation whether a country had access to the international capital market. Concerning the model's forecasts we assumed that if the calculated probability for a particular country exceeds 0.5 that country is predicted to have access to the international capital market.
  10. The correlation coefficient does not give much information because the dependant variable is a binary dummy [Pindyck and Rubinfeld 1981: 301].
  11. Possible multicollinearity between  $Y/P$  and  $I/Y$  does not seem to be a problem as well-known rules of thumb [Pindyck and Rubinfeld, 1981: 89, 90] show. First, the standard error of the coefficient of  $Y/P$  hardly changes if  $I/Y$  is dropped from the equation. Second, the simple correlation between  $Y/P$  and  $I/Y$  appears to be smaller than the correlation of both variables with the dependent variable.

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## APPENDIX 1

### *List of Countries*

#### A. HICs:

Argentina  
Bolivia  
Brazil  
Chile  
Colombia  
Costa Rica  
Cote d'Ivoire  
Ecuador  
Jamaica  
Mexico  
Morocco  
Nigeria  
Peru  
Philippines  
Uruguay  
Venezuela  
Yugoslavia

#### B. SUB-SAHARAN AFRICA:

Benin  
Botswana  
Burkina-Faso  
Burundi  
Cameroon  
Central African Republic  
Chad  
Comoros  
Congo

Ethiopia  
Gabon  
Ghana  
Guinea  
Guinea-Bissau  
Kenya  
Lesotho  
Liberia  
Madagascar  
Malawi  
Mali  
Mauritania  
Mauritius  
Mozambique  
Niger  
Rwanda  
São Tomé  
Senegal  
Seychelles  
Sierra Leone  
Somalia  
Sudan  
Swaziland  
Togo  
Uganda  
United Republic of Tanzania  
Zaire  
Zambia  
Zimbabwe

C. ASIA:

Bangladesh  
Burma  
China  
Fiji Islands  
Hong Kong  
India  
Indonesia  
Korea Republic  
Malaysia  
Nepal  
Pakistan  
Papua New Guinea  
Thailand



## D. REST:

Algeria  
Bahamas  
Barbados  
Belize  
Cyprus  
Democratic Yemen  
Dominican Republic  
Egypt  
El Salvador  
Greece  
Grenada  
Guatemala  
Guyana  
Haiti  
Honduras  
Israel  
Jordan  
Maldives  
Nicaragua  
Oman  
Panama  
Paraguay  
Portugal  
Syria  
Solomon Islands  
St. Vincent  
Trinidad  
Yemen, Arab

## APPENDIX 2

*Data Sources**(a) Gross Debt*

Most figures are from World Bank [1989b]. Some are from World Bank [1987, 1988b] and OECD [1987a].

*(b) Net Debt*

We calculated net debt positions of the different countries by subtracting cross-border liabilities of Western banks [BIS, 1987 and 1989] from the gross debt data. An alternative method was used for the *offshore banking centres*, where we deducted total reserves [IMF, 1986 and 1988a] from the gross debt figures (see Van Bergeijk and Lensink [1989a] for details on the method).

*(c) GDP (in thousands of dollars and at 1985 prices)*

World Bank [1986, 1987 and 1988a] and United Nations [1987]. Figures for 1984 and 1986 were converted into 1985 prices using the real effective exchange rate of the US dollar against 18 industrial countries and 22 LDC currencies [Morgan Guaranty, 1988: 16].

*(d) Exports and Imports*

Refers to Merchandise Exports and Imports f.o.b., IMF [1989b].

*(e) International Reserves*

Most figures are from IMF [1989b], some are from IMF [1988a].

*(f) Population*

United Nations [1987] and World Bank [1986, 1987 and 1988a].

*(g) Restructuring*

Dillon and Oliveros [1986] and Keller and Weerasinghe [1988].

*(h) Funds Raised on the International Capital Market*

OECD [1987b and 1989: Table S2].

*(i) Gross Domestic Investment as Percentage of GDP*

Most figures are from World Bank [1989a: Table 13]; some are from UNCTAD [1988a].

*(j) Growth Rates of Real GDP*

World Bank [1989a: Table 6].

*(k) Short-term Debt*

World Bank [1989b].

*(l) Debt-Service as Percentage of Exports of Goods and Services*

Total debt-service divided by merchandise exports.

*(m) Inflation*

Calculated as the growth in the GDP deflator, or in the case where a GDP deflator was not available, as the growth in consumer prices, from IMF [1989a].

*(n) Debt Service as Percentage of GNP*

Most figures are from World Bank [1989a]; some are from World Bank [1987; 1988a] and UNCTAD [1988a].

*(o) Use of Fund Credit*

Use of Fund Credit (GRA): Per cent of Quota, from IMF [1989a].

